Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Title V draft permit No. V-98-xxx
THE HENNEGAN COMPANY
FLORENCE KY.
May 11, 2000
KEITH METZKER REVIEWER
Plant I.D. # 079-0280-0088
Application Log # F366

SOURCE DESCRIPTION:

The source consists of 2-6 color web heat set ink presses, 1 UV curing coating applicator, 1-5 color sheet fed press using air drying ink, 4-6 color sheet fed presses using air drying ink, and 1-8 color sheet fed press using UV drying ink. The source has also applied to install an additional 8 color sheet fed printing press that will use UV drying ink.

Both the 6 color web heat set ink presses consist of 6 applicators which use a fountain solution to distinguish print area from non-print area, an oven vented outside the building without any controls, and a chiller. The ink is stored in 4 foot tall (approximately) totes and is pumped directly into the presses. The presses are designed to use a maximum of 3.36 gallons on ink per hour. The presses have computer controlled automated wash-up equipment which uses an expanding diaphragm to clean ink from the press.

One of the 6 color web heat set ink presses has a UV coating applicator at the end. The UV coating applicator has the potential to emit no VOCs and will receive very little attention in the Title V permit.

The air drying sheet fed presses are all essentially the same. The sheet fed presses each consist of a loading area, ink application stations, an aqueous coating application station (one machine has this removed), a dryer, a starch applicator (the machine with the aqueous coater removed also has this removed), and an unload area. Each press has 5 or 6 application stations (depending on the number of colors the press can apply) which use a fountain solution to distinguish print area from non-print area. Each station is designed to apply a maximum of 7.38 gallons of ink per hour but, due to the digital nature of the printing, no colors will be overlapped and the entire press may only apply 7.38 gallons of ink per hour. At the application stations, ink is troweled into an open leveler, removed after the job is done, cleaned out, and new ink is troweled into the station for the next job. Ambient air is blown across the sheets to dry the ink. Unlike the heatset ink web presses the sheet fed presses do not have automated cleanup equipment. These presses are manually cleaned. Hennegan will be removing one of the 6 color sheet fed presses before the new 8 color press is constructed (this is not required and the permit will be written as if this was not happening but the press is being traded in).

The sheet fed 8 color UV ink press is similar to the air drying sheet fed presses. The main exceptions are that a UV lamp is used to set the ink to the sheet of paper and each application station is designed to apply a maximum of 7.66 gallons of ink per hour.

COMMENTS:

Type of control and efficiency

Presently there are no controls on any of the equipment, however, practices are being used to avoid emissions. Although isopropyl alcohol is still used, use of fountain solution alcohol substitutes has lowered alcohol usage (lower vapor pressure of the substitutes creates lower net emissions). Cleaning materials are contained after used in order to reduce their emissions. Refrigeration is also used on the fountain solution to slow the evaporation of isopropyl alcohol.

A thermal oxidizer shall be installed to control emissions from the presses that use heat set inks. Control efficiency will be determined by stack testing and is required to be at least 90%. Guidance found in the Draft CTG document Control of Volatile Organic Compound Emissions from Offset Lithographic Printing and the ACT document Offset Lithographic Printing was used in evaluating the total emission control. Based on the guidance, 100% of the emissions from the heat set inks will be captured to the control device if the oven maintains negative pressure. 40% capture of cleaning solution emissions and 70% capture of fountain solution emissions will also result based on the guidance. These figures will be used unless demonstrated not to apply.

Isopropyl alcohol usage shall also be reduced as required by the Title V permit being issued.

Emission factors and their source

The ovens on the heat set presses each have 2-2.93 MM Btu/hr maximum heat input burners using natural gas to directly heat the web. AP-42, Chapter 1, Section 4 emission factors for boilers between 0.3 and 10 MM Btu/hr maximum heat input capacity were used to estimate the emissions from the 4 burners.

Particulate emissions from the presses have been assumed to be minimal as long as the presses are operated properly, appropriate inks are used, and natural gas is burned in the ovens. This is based on the Method 5 test performed April 6 and 7, 1976 at a web press used by Danner Press located in Canton, Ohio. Due to the existence of small amounts of particulate matter reported in the above mentioned 1976 test, 401 KAR 59:010, New process operations, will apply to the heat set presses but will cause little burden to the source. Some sheet fed presses apply starch to the sheets. This process is controlled by a filter and is vented inside the pressroom. This emission will also be considered minimal due to the control realized from the filter, the falling out in the pressroom, and the filtering associated with the ventilation system used by Hennegan. 401 KAR 59:010 will also apply to these presses but again will cause little burden to the source.

VOC emissions will be based on substrate retention factors found in the Draft CTG document Control of Volatile Organic Compound Emissions from Offset Lithographic Printing and a material balance of the processes involved in the printing. All emission factors are based upon the maximum concentration of VOC for each group of press items as shown by the MSDSs provided by Hennegan. The following is a detailed list of VOC concentrations, retention factors, and emission factors used

	Density		% VOC		1-retention		Emission Factor	
Heatset Ink	8.00	x	40.00%	x	0.80	=	2.560	lbs/gal
Sheet Fed Ink	8.85	x	20.60%	x	0.05	=	0.091	lbs/gal
UV Ink	10.03	x	20.60%	x	0.05	=	0.103	lbs/gal
Isopropyl Alcohol	6.57	x	100.00%	x	1.00	=	6.571	lbs/gal
Non-IPA Fountain Additive	8.90	x	18.31%	x	1.00	=	1.630	lbs/gal
Cleanup Solvent	6.80	x	97.06%	x	0.50	=	3.300	lbs/gal
Silicone Emulsion	8.20	x	0.00%	x	1.00	=	0.000	lbs/gal
Starch	5.84	x	0.00%	x	1.00	=	0.000	lbs/gal
Aqueous Coating	8.63	x	14.60%	x	1.00	=	1.260	lbs/gal

in this evaluation.

Applicable regulations

Regulation 401 KAR 51:010 defines Boone County as being moderate ozone nonattainment. Since the source is major and located in a moderate ozone nonattainment area regulation 401 KAR 50:012, standards for construction or modification of stationary sources within nonattainment areas effective June 24, 1992, requiring implementation of standards for national primary and secondary ambient air quality, applies and specifies that control procedures that are reasonable, available, and practical shall be used (Note: 401 KAR 50:012 was changed during the course of this evaluation. The changes only clarified the meaning and requirements of the regulation but did not change the resulting limits set due to application of 401 KAR 50:012.). Since requirements of 401 KAR 50:012 specifically applicable to Hennegan were not promulgated by the cabinet, EPA approval of the permit is required and a public hearing is to be held (just like any other SIP revision).

Regulation 401 KAR 59:010, New process operations applicable to each affected facility associated with a process operation commenced after July 2, 1975 applies but will cause little impact on this source due to the reasons referenced in the Emission factors and their source section of this paper.

Regulation 401 KAR 51:052, Review of new sources in or impacting upon nonattainment areas, could have been triggered but has not. Conditions in the Title V permit will be spelled out to assure that construction projects remain either less than major or less than significant (depending on the size and timing of the projects).

EMISSION AND OPERATING CAPS DESCRIPTION:

By reviewing Form DEP7007B it has been determined that 3 separate construction projects have occurred at Hennegan and 1 additional project is projected for late 1998. All projects at Hennegan will be required to comply with limits set by 401 KAR 50:012. 01W was constructed in 1986 and only has the above referenced limit. 02W and 01SF were constructed in 1991 and will have limits to avoid application of 401 KAR 51:052 (this modification would be major by itself without limits). 02SF, 03SF, 04SF, 05SF, and 06SF were constructed in 1996 and accepted less than significant restrictions at the time of construction in order to avoid application of 401 KAR 51:052. 07SF is projected to be constructed in late 1998 and will also need limits to avoid application of 401 KAR 51:052.

The limits imposed by 401 KAR 50:012 are based on guidelines from control technology documents published by the EPA. The following limits have been approved by the Cabinet and have been accept by the permittee.

Operational limits

1) Negative pressure must be maintained on the heat set press ovens,
2) Isopropyl alcohol usage in the fountain solution of the heat set presses is limited to a maximum of 3% content by volume if the fountain is refrigerated below 60° F or a maximum of 1.6% alcohol content by volume for fountains at or above 60° F,
3) Isopropyl alcohol usage in the fountain solution of the sheet fed presses is limited to a maximum of 8.5% content by volume if the fountain is refrigerated below 60° F or a maximum of 5% alcohol content by volume for fountains at or above 60° F,
4) Cleaning solutions are limited to less than 30% VOC content or a VOC partial pressure of less than 10 mm Hg @ 20° C provided closed containers are used to contain unused and waste portions (including solvent laden towels) as demonstrated by at least 50% recovery of the cleaning solution, and

Emission Limit

1) At least 90% of all VOC emissions captured by the heat set press oven exhausts must be eliminated from the stack before released to the atmosphere.

401 KAR 51:052 avoidance will impose the following limits.

1) 02W and 01SF are limited to less than 100 tons per year of VOC emissions.
2) 02SF, 03SF, 04SF, 05SF, and 06SF are limited to less than 40 tons per year of VOC emissions.
3) 07SF is limited to less than 40 tons per year of VOC emissions.

See permit for specific restrictions accepted to ensure compliance.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.